

**IN THE CLAIMS**

The following is a complete, marked up listing of revised claims with a status identifier in parentheses, underlined text indicating insertions, and strikethrough and/or double-bracketed text indicating deletions.

**LISTING OF CLAIMS**

Claims 1-11 (Cancelled).

12. (Previously Presented) A method of optimizing transmit covariance for a multiple antenna transmitter, comprising:

determining spatial steering of parallel symbol streams and a transmit power of each symbol stream based on a statistical distribution of a channel, the determining step, for each symbol stream, including,

determining a first possible transmission power based on a  $k$ th transmission power for the symbol stream, where  $k$  represents an interval of time,

determining a second possible transmission power based on the  $k$ th transmission power for the symbol stream and the statistical distribution of the channel, and

determining the  $(k+1)$ th transmission power for the symbol stream based on the first and second possible transmission powers.

13. (Original) The method of claim 12, wherein the determining the  $(k+1)$ th transmission power further comprises:

selecting one of the first and second possible transmission powers; and

scaling the selected transmission powers for the symbol streams so that a sum of the selected transmission powers for the symbol streams does not exceed an available amount of power at a transmitter, the scaled selected transmission powers serving as the (k+1)th transmission powers.

14. (Original) The method of claim 13, wherein the selecting step selects a maximum one of the first and second possible transmission powers.

15. (Original) The method of claim 12, wherein the determining a second possible transmission power step determines the second possible transmission power based on the (k)th transmission power, the statistical distribution of the channel, and an available amount of power at a transmitter.

16. (Original) The method of claim 12, wherein the determining a second possible transmission power step determines the second possible transmission power based on the (k)th transmission power, the statistical distribution of the channel, and a noise power at a receiver.

17. (Original) The method of claim 12, wherein the determining a second possible transmission power step determines the second possible transmission power based on the (k)th transmission power, the statistical distribution of the channel and a number of receive antennas.

18. (Currently Amended) The method of claim 12, wherein the determining the (k+1)th ~~second possible~~ transmission powers step determines the (k+1)th ~~second possible~~ transmission powers according to the following expression:

for  $m=1, \dots, M$ , where  $M$  is the number of transmit antennas,

$$p'_m(k+1) = \max \left( p_m(k), \frac{E \left[ \text{Tr} \left\{ B_{-m} + \frac{P}{M\sigma^2} \tilde{H}_m \tilde{H}_m^H A \right\} \right] - N}{E \left[ \frac{\tilde{H}_m (B_{-m})^2 \tilde{H}_m}{M\sigma^2 + p_m(k) \tilde{H}_m B_{-m} \tilde{H}_m^H} \right]} \right)$$

where  $p'_m(k+1)$  is a  $(k+1)$ th second possible transmission power for the  $m$ th symbol stream,  $H$  represents the statistical distribution of the channel,  $\tilde{H} = HV$  with  $V$  computed to be the eigenvectors of  $E[H^H H]$ ,  $N$  is a number of receive antennas,  $\sigma^2$  indicates an arithmetic mean of the noise variances at the  $N$  receive antennas, matrix  $A$  is given by,

$$A = \left( I + \frac{1}{M\sigma^2} \tilde{H} P(k) \tilde{H}^H \right)^{-1}$$

while the  $M$  matrices  $B_{-m}$ ,  $m=1, \dots, M$ , are given by

$$B_{-m} = \left( I + \frac{1}{M\sigma^2} \tilde{H}_{-m} P_{-m}(k) \tilde{H}_{-m}^H \right)^{-1}$$

where  $\tilde{\mathbf{H}}_{-m}$  and  $\mathbf{P}_{-m}(k)$  indicate the corresponding matrices without the  $m$ -th column, and  $\tilde{\mathbf{H}}_m$  denotes the  $m$ -th column of  $\tilde{\mathbf{H}}$ .

19. (Previously Presented) A method of optimizing transmit covariance for a multiple antenna transmitter, comprising:

determining spatial steering of parallel symbol streams and a transmit power of each symbol stream based on a statistical distribution of a channel, the determining step  
determining a transmission power for each symbol stream that tracks an optimal transmission power for the symbol stream based on a previously determined transmission power for the symbol stream and the statistical distribution of the channel.